Case Report

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PERHAPS the most interesting features of this report are the attempt to correct what was considered to be forward drift of all buccal segments and the degree of lateral arch development attained after the growth period.

History: The patient was a woman 29 years of age who weighed 105 pounds. Her mother's general health was good and her teeth and jaws relatively normal. A Class II malocclusion with a general history of eczema and hay fever was recorded by the father. Both of the patient's older brothers had a Class II malocclusion. During the patient's early childhood she fought mouth breathing lest she develop the appearance of her two brothers, and she succeeded in overcoming it except at intervals when she had hay fever. This effort developed a hypertonic buccal musculature but failed to entirely overcome the hypotonicity of the obicularis oris and labial muscles. Her mentalis was abnormally active. Her general health was good.

Dental and Orthodontic Examination: The patient's upper arch was very narrow, hence elongated, which caused a prominent upper lip appearance. The central incisors were pushed labially; the upper left lateral erupted far to the lingual. The cuspids were rotated distal to buccal, slightly overlapping the first bicuspids. The Class II relation on the right side carried the median line to the left of the center of the face. The lower arch was also very narrow, particularly in the cuspid and bicuspid area. The median line was to the left and the left lateral was blocked entirely out of the arch toward the lingual. The central incisors were much to the lingual of the uppers and the distal incisor angle of the left central was locked to the labial of the upper left lateral. This case was considered a Class II, Division I, subdivision with the right abnormal. There was a gold crown on the non-vital right upper first molar which was of ill shape, too wide, and the lingual occlusal ridge occluded with the lingual occlusal ridge of the lower. All other restorations were in harmony with the occlusion.

Case Analysis: The patient started mouth breathing at an early age. There was a general lack of lateral growth stimulation. Prolonged retention of deciduous teeth resulted in a tardy eruption of the permanent teeth. The upper centrals erupted to labial before the deciduous incisors were lost. The narrow elongated arches forced a forward position of the buccal teeth in relation to their normal bases in both upper and lower arches. The most normal labiolingual tooth position was that occupied by the right lower lateral.

Outline of Objectives: The objectives of treatment were as follows:

1. Carry upper and lower buccal segments distally.
2. Correct Class II relation on the right side.

3. Attain normal arch width development in both maxilla and mandible in harmony with median line.
4. Correct rotations.

Treatment: The appliance used was the Edgewise arch mechanism supplemented by occipital anchorage with traction bar and A. LeRoy Johnson respiration shield. All teeth in both arches were banded at the outset, except the upper third molars which were banded early in treatment. It was considered expedient to compromise ideal management by early extraction of the lower third molars and the uppers at the beginning of Class II treatment. The strategy* employed was as follows: The upper arch, except for the mildest effort to avoid forward tip, was adapted passively to avoid expansion or any other disturbance of the stability of this arch, which was to be used for distal movement of the mandibular buccal segments with Class III elastics. The lower arch was adjusted to the labial of the lower anterior teeth, which were not disturbed until the buccal segments were moved distally.

The time and duration of various steps in treatment were as follows: Class III treatment was instituted June 10, 1930 and seven months were spent in carrying lower buccal segments distally. In an effort to hold Class III results, the lower arch was tied passively to all available teeth with stops mesial to sheaths to support and protect insecure contacts. The upper third molars were extracted and the upper arch was left undisturbed. For the next three months the patient wore a respiration shield while indulging in a period of rest, in the hope that the upper arch would retrace its path of any forward movement experienced during Class III treatment.

Class II treatment was begun in April, 1931. A new upper arch approaching ideal form was adapted in a passive way except for expansion and occlusal buccal torque in the buccal segments. Upper first bicuspids were tied back to spurs on the arch which was labial to the anterior six teeth. Class II elastics were applied for the first time. When bicuspids were back of cuspids, spurs were moved to distal of cuspids. Then as space developed and as cuspids and laterals were expanded, centrals were engaged and moved back in position.

The intermaxillary relation on the right side was retained with an incline plane soldered to a band on the right lower first bicuspid. Due to lack of harmony in the width of the arches and cusp relation, this did not hold and it was necessary to replace elastics, prolonged action of which to a degree impaired our distal position.

In October, 1933, occipital anchorage was applied to both upper and lower arches, continuous for a while and later at night only. At the same time lateral development of the mandible was started by the use of cuspid spurs with an arch more and more approaching the ideal. To avoid any forward movement the lower anterior teeth were not tied to the arch during this part of the treatment because the lower arch was sprung to the labial with each adjustment. In November, 1933, lateral development of the mandible had reached what was considered normal arch width. A new ideal arch was tied in place and the lower anterior teeth aligned, after which ensued a period of active retention.

* Term used here as employed by Dr. Spencer Atkinson, *J.A.D.A.*, 24:560-74, Apr. 1937.

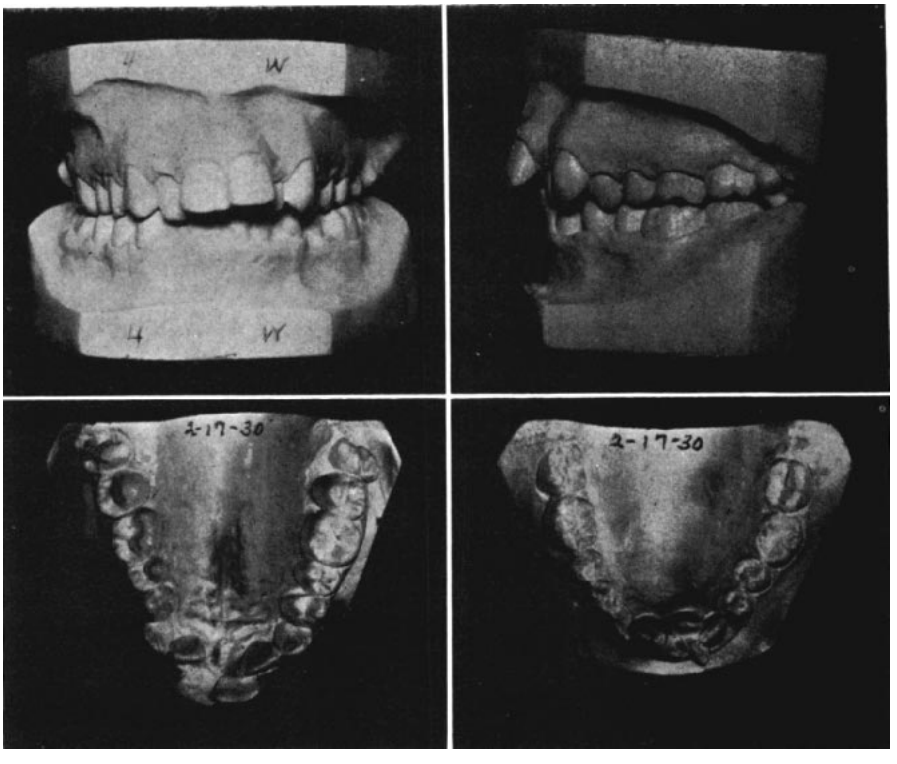

Fig. 1.—Casts of February, 1930, before treatment was instituted.

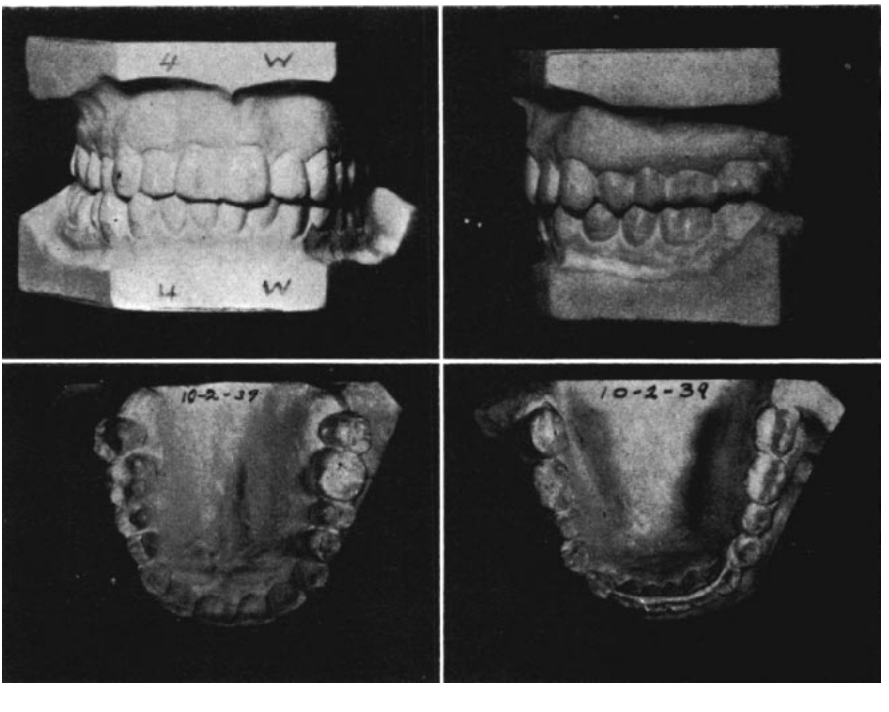

Fig. 2.—Casts of October, 1939.

Retention: All appliances were removed and occipital anchorage was discontinued in November, 1934. The methods employed in meeting the objectives of retention were as follows: Preservation of the maxillary arch width by upper plate worn for about one year, and retention of mandibular arch width by bands on the lower left second bicuspid and right first bicuspid with lingual wire connecting. Rotations were retained with bands and spurs. The mesiodistal relation on the right side was stabilized by inclined plane on band. The position of the upper central incisors was not only held but improved by a respiration shield.* Lower retention was removed after a little more than two years. At the end of five months the case had relapsed slightly in the right lower cuspid region, the limitations of which were hard to estimate. This was adjusted and the retainer replaced on the lower first bicuspids with lingual bar.

Summary and Comment: With the desire to conserve all possible anchorage, the upper third molars were left in place and the arch was not disturbed until the lower buccal segments were carried distally. In the mandible lateral development was postponed and the lower anterior teeth not disturbed until the upper teeth were carried distally into normal intermaxillary relation.

Development of arch width in the maxilla and mandible is shown by the following measurements:

From tip to tip of lower cuspids, before 19 mm., after 28 mm.
From occlusal pits of first bicuspids, before 23½ mm., after 33 mm.
Occlusal pit of first molars, before 41 mm., after 48 mm.
Apical region cuspid to cuspid, before 26 mm., after 32 mm.
Second bicuspids, before 44 mm., after 49 mm.
Upper cuspids tip to tip, before 48 mm., after 48 mm.

Measurements in the mouth after treatment, as near as it was possible to judge, appeared the same as over models.

In spite of the age of this patient (29 years) it is of interest to note that an effort to correct what appeared to be a forward drift of all buccal segments was reasonably successful. In addition, from 6 to 9 millimeters of lateral development was accomplished without any marked loss of tissue around the supporting structures. The patient, with an intellect above average, had ideas of her own all through the course of treatment, often to the dismay of the operator. Today she has obtained an understanding of the picture of balance which prompts her to insist on continuation of lower retention. She advises that she still wears a respiration shield part time, although this has not been discussed for some years.

Occipital anchorage was considered to be a valuable adjunct to anchorage within the mouth and can be used to advantage in treatment both as a protective influence to intraoral anchorage and as an independent force in the treatment of cases.

Many adult cases may be safely and successfully treated by giving proper consideration to anchorage during treatment, and a careful analysis of the problem of retention after the active appliances have been removed.

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* The device used is that described by Dr. A. LeRoy Johnson, The Orthodontic Respiration Shield, *D. Cosmos*, 58:325-377, 1916.